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PRODUCTION OF CUSTOMER REQUIRED INDIVIDUALIZED „HYBRID“-DECORATIVE PARTS OF WHEELS THROUGH THE COMBINATION OF INJECTION MOLDING TECHNIQUE AND ADDI

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PRODUCTION OF CUSTOMER REQUIRED INDIVIDUALIZED „HYBRID“-DECORATIVE PARTS OF WHEELS THROUGH THE COMBINATION OF INJECTION MOLDING TECHNIQUE AND ADDITIVE MANUFACTURING

Technical Task:

Currently, decorative parts of wheels, made of thermoplastic material, are mainly manufactured with the help of injection molding technology and subsequent surface finishing. It is also possible to produce metallic wheel parts. The wheel parts are attached to the rim by means of joining technology.

Initial Situation:

In order to produce a geometrically differentiated variant of the wheel rim, a new wheel-insert must be used, which requires a new injection molding tool or casting tool.

Solution:

The technical innovation of this idea consists in the production of an individualized component by combination of basic body (for example injection molding technology, RIM, RTM, sheet metal, etc.) and additive production with subsequent joining process of the individual parts or by injection molding of the additively manufactured part.

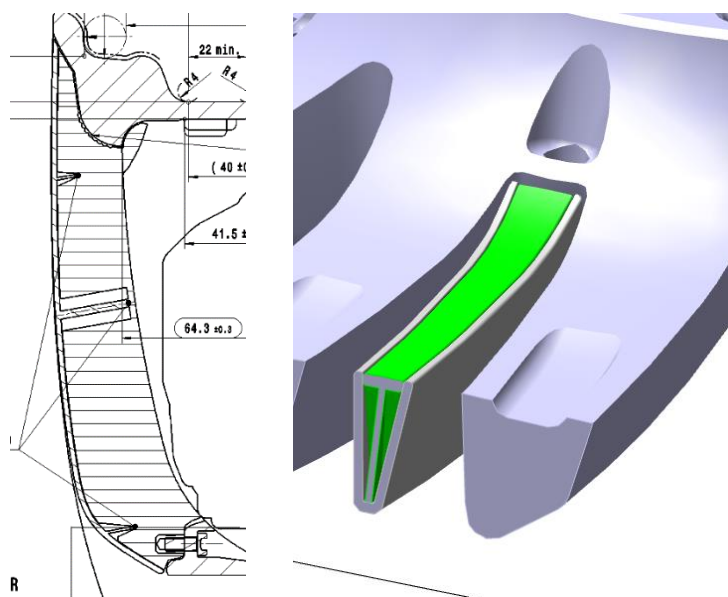
Thereby, at least two separate items are made. On the one hand the functional base body, on the other hand at least one design element using additive manufacturing. As a design element, both thermoplastic and thermosetting systems such as metallic materials are used.

This individualized component can be joined either directly to the wheel rim or indirectly via a wheel insert and then onto the wheel rim. As decorative parts of wheels, all wheel rim accessories associated with the cast or forged are meant. The individual parts are connected to each other by means of joining processes. Such methods are screwing, clipping or bonding. In addition, it is also possible to manufacture the design element with the base part in the injection molding process by the so-called injection molding technique.

The technical implementation consists of the production of the individualized component by means of additive manufacturing. This component may consist of a metallic or non-metallic (thermoplastic, thermosetting) base material. Furthermore, the manufacture of the wheel-inserts made of metallic or non-metallic base material.

Direct connection of the 3D printing component **1**) by joining with the wheel rim **2**) or indirect connection of the 3D printing component **1**) by joining with wheel-inserts **3**) and then with the wheel rim **2**).

Joining processes refers to all known processes with form and/or adhesion principle.



Advantages:

- Possibility of a high degree of individualization of the wheel rim (for example, it would be possible to produce a family crest or a personal signature using additive manufacturing),
- Very high efficiency compared to the pure additive manufacturing of the complete insert,
- High strength due to the use of an injection-molded body for connection to the rim,
- No need for a separate function assurance of the individualized variant, since assumption of the strength requirement by injection-molded carrier and additively manufactured component as a pure design element, and Use of a metallic or non-metallic (thermoplastic, thermosetting) base material.